WHAT IS CLAIMED IS:

1   1.   A method for simulating film grain, comprising the steps of:

2   receiving an encoded image

3   receiving film grain characterization information indicative of grain in a film on which

4 the encoded image was originally recorded,

5   decoding at least the encoded image;

6   simulating a pattern of film grain in accordance with the received film grain

7 characterization information; and

8   blending the simulated film grain pattern with the decoded image.

1   2.   The method according to claim 1 further comprising the steps of:

2   receiving the encoded image in an ITU-T H.264 video coding format; and

3   receiving the film grain characterization information as a Supplemental Enhancement

4 Information (SEI) Message.

1   3.   The method according to claim 1 wherein the step of receiving the film grain

2 characterization information includes the step of receiving an identifier of which type of film

3 stock was originally used to record the encoded image.

1   4.   The method according to claim 1 wherein the step of receiving the film grain

2 characterization information includes the step of receiving an identifier of a model that best

3 approximates the film grain in the film stock originally used to record the encoded image.

1   5.   The method according to claim 1 wherein the step of receiving the film grain

2 characterization information includes the step of receiving information indicative of film grain

3 size, intensity, spatial correlation, and color correlation.

1   6.   The method according to claim 1 further including the step of separately

2 simulating the pattern of film grain for separate groups of frames in the encoded video.

1   7.   A method for simulating film grain, comprising the steps of:

2   encoding an image originally recorded on film;

3   identifying the film grain present in the input image; and

4   establishing film grain characterization information for the film in accordance with a

5   predefined modeling process so that upon decoding the encoding image, a pattern of film grain

6   can be simulated in accordance with the film grain characterization information and blended with

7   the decoded image.

1   8.   The method according to claim 7 further comprising the steps of:

2   encoding the image in an ITU-T H.264 video coding format; and

3   formatting the film grain characterization information as a Supplemental Enhancement

4   Information (SEI) Message.

1   9.   The method according to claim 7 wherein the step of establishing the film grain

2   characterization information includes the step of identifying which type of type of film stock

3   originally recorded the encoded image.

1   10.   The method according to claim 7 wherein the step of establishing the film grain

2   characterization information includes the step of identifying a model that best provides an

3   indication of film grain in the film originally recorded the image.

1   11.   The method according to claim 10 wherein step of identifying the model includes

2   choosing among a best model among a plurality of film grain models.

1   12.   The method according to claim 7 wherein the step of establishing the film grain

2   characterization information includes the step of establishing film grain size, intensity, spatial

3   correlation, and color correlation.

1   13.   The method according to claim 7 further including the step of removing film grain

2   from the image prior to encoding.

1   14.   Apparatus for simulating film grain in an image, comprising of:

2   a decoder for receiving an encoded image and for receiving film grain characterization

3   information indicative of grain in a film on which the encoded image was originally recorded and

4   for decoding the image; and

5   a film grain restoration processor for simulating a pattern of film grain in accordance with

6   the received film grain parameter information; and for blending the simulated film grain pattern

7   to the decoded image.

1   15.   The apparatus according to claim 14 wherein the decoder receives the film grain

2   characterization information as parallel information to the encoded image.

1   16   The apparatus according to claim 14 wherein the decoder receives the encoded

2   image in an ITU-T H.264 video coding format; and wherein the decoder receives the film grain

3   characterization information as a Supplemental Enhancement Information (SEI) Message.

1   17.   The apparatus according to claim 14 wherein the film grain characterization

2   information includes an identifier of which type of film stock originally recorded the encoded

3   image to provide an indication of film grain.

1   18.   The apparatus according to claim 14 wherein the film grain characterization

2   information includes an identifier of a model that best provides an indication of film grain in the

3   film originally recorded the encoded image to provide an indication of film grain.

1   19.   The apparatus according to claim 18 wherein the model identifier identifies the

2   best model among a plurality of film grain models.

1   20.   The apparatus according to claim 14 wherein the film grain characterization

2   information includes information indicative of film grain size, intensity, spatial correlation, and

3   color correlation.

1   21.   The apparatus according to claim 14 wherein the film grain restoration process

2   separately simulates the pattern of film grain for separate groups of frames in the encoded video.